CLAIMS

What is claimed is:

1. An isolated, homogeneous population of mesenchymal stem cells which can differentiate into cells of more than one connective tissue type, wherein said mesenchymal stem cells are obtained from bone.

2. The mesenchymal stem cells of **Claim 1**, wherein said mesenchymal stem cells are obtained from human trabecular bone.

3. The mesenchymal stem cells of **Claim 1**, wherein said mesenchymal stem cells are obtained from human iliac crest.

4. The mesenchymal stem cells of **Claim 1**, wherein one of said connective tissue types is selected from the group consisting of bone, cartilage, adipose, tendon, ligament, and dermis.

5. The mesenchymal stem cells of **Claim 1,** wherein said mesenchymal stem cells are transiently or stably genetically engineered to express one or more gene products.

6. The mesenchymal stem cells of **Claim 5,** wherein said one or more gene products are members of the transforming growth factor-β superfamily.

7. A therapeutic composition comprising the mesenchymal stem cells of **Claim 1** and a pharmaceutically acceptable carrier, wherein said mesenchymal stem cells are present in an amount effective to produce connective tissue cells.

8. The therapeutic composition of **Claim 7**, wherein said connective tissue is selected from the group consisting of bone, cartilage, adipose, tendon, ligament, and dermis.

9. The therapeutic composition of **Claim 7**, wherein said mesenchymal stem cells are transiently or stably genetically engineered to express one or more gene products.

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